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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,753	03/21/2006	Hajime Nakamura	062281	9440

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EXAMINER	
HOBAN, MATTHEW E	

ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
09/03/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No.	Applicant(s)	
	10/572,753	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Matthew E. Hoban	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11 and 19-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11 and 19-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/4/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 11, 19-26 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura in 4859255 in view of Kim in 7163591 and further in view of

Nakamura in the english translation of their publication entitled "Magnetic Properties of Miniature Nd-Fe-B Sintered Magnets" (appearing in the IDS filed 11/30/2007).

Regarding Claim 11: Fujimura teaches permanent magnets of the (Fe,Co)-B-R family (wherein the amount of Co can be 0) (See Abstract). These magnets are made by the basic steps as set forth in column 8, lines 25-50, with an additional optional aging step which can be performed at from 350 to the sintering temperature, where in the sintering temperature is defined as anything between 900 and 1200 C (See Column 8, Lines 5-20).

Fujimura does not use a heat treatment where a powder of a fluoride of R is disposed on the sintered magnet form.

However, Kim teaches that by incorporating a heat treatment step wherein any of DyF_3 Dy_2O_3, PrF_3 and NdF_3 is disposed with the sintered magnetic composition in order to increase many of the properties of the form (see Figure 4). The specific properties improved include iHc, M (See Paragraph 49-51), as well as increasing the microstructural soundness and uniformity of the grains as well as increasing the smoothness of the surface. This leads to a lower nucleation rate of reversed domains, leading to higher coercivity (See Paragraph 53-56).

Therefore, it would have been obvious based on the teachings of Kim to include a heat treatment step including any of the disclosed additives with the sintered form, after the initial sintering of the composition. This fits well with the Fujimura reference, as this reference also uses a sintering step. Therefore, the magnetic form of Fujimura could have similar improvements in the above stated properties as taught by Kim. This would provide ample motivation to one of ordinary skill in the art to combine these references

Fujimura in view of Kim are silent as to the use of a slurry to dispose the powder on the magnetic form.

However Nakamura teaches that fine powders such as those taught by Kim can be disposed on the sintered magnetic form by a dip coating process, wherein either an oxide or fluoride of Dysprosium is dispersed. This process is followed by a heat treatment and aging step as is taught by Kim. As the process of disposing a powder in solid form or a liquid form as substantially shown as being useful for an equivalent purpose, one of ordinary skill in the art would find that it would have been obvious to substitute the powder disposing step of Kim with that of Nakamura. Substitution of functionally equivalent steps in a process represents a prima facie case of obviousness. One of ordinary skill in the art would be motivated to employ the step of Nakamura based on this equivalence, but also possibly on the fact that dipcoating is generally more automatable and controllable as the depth of such a coating is based on the surface tension of the liquid (See Page 12-13 of Nakamura).

Regarding Claims 19, 30-32: Nakamura teaches the creation of magnets by this process having a size of 4x4x0.5mm.

Regarding Claims 20: The filling factor of the additive as used by Kim is at least 10% which is evidenced by the fact that the surrounding space contains no other fillers aside from the liquid containing dysprosium fluoride/oxide. Thus the filling factor of the additive as compared to other fillers would be greater than 10% and would be nearly 100%.

Regarding Claim 11 and 21: The particle size of the additive as used by Kim is between .1 and 50 microns as evidenced by line 36 of column 3. This particle size would also be useful in the process of Nakamura as it is for the same purpose.

Regarding Claim 21-22: At column 5, Lines 17-25 Kim gives several options for the R-compound useful in his invention including composition where R is Dy. This selection is also mirrored by Nakamura.

Regarding Claim 23: As stated previously, Kim gives a method in Column 3 where R-fluoride powders are heat treated in conjunction with R-Fe-B magnets. This heat treatment would inherently create diffusion of both R and fluoride Atoms into the R-Fe-B magnet and vice versa, meaning that some amount of additive would inherently be

absorbed by the magnetic particles. This phenomenon is noted by Kim at column 5, line 60 through column 6, line 5.

Regarding Claim 24: At Column 4, Line 57-62 Kim draws particular attention to the Nd-Fe-B magnet system. This system is characterized by the formula Nd2FeB14. Therefore, this magnet contains 11.6 at% Nd. Although other formulae are known with slightly higher conc. of rare earth.

Kim goes on to draw particular attention to the effects of Dysprosium compounds, where these compounds are used to increase and maximize iHc of the sintered magnetic form. Dysprosium Fluoride and Dysprosium Oxide contain 100 at% Dy and contains 0 at% Nd (See Column 5, Lines 25-28). Thus a system using Nd-Fe-B as a sintered magnetic form and Dysprosium compounds as an additive meets all the limits of Claim 8.

Regarding Claim 25: Kim and Nakamura teach using only R-compounds in the additive, which are comprised only of such fluorides. Thus the balance could be considered to be composed of nitrides, oxides, hydroxides and hydrides of R, since compounds such as oxides and hydroxides would be common impurities. Nevertheless, Kim and Nakamura teach powders comprising entirely R-Fluorides so the balance of the composition outside of R-Fluorides would essentially be 0. The claim language does not necessarily state that the powder can not be entirely comprised of

Fluoride and therefore does not necessitate the inclusion of nitrides, oxides, hydrides, carbides, or hydroxides.

Regarding Claims 26: The process of Fujimura in view of Kim would include the heat treatment of Kim between the sintering and aging of the powders. Kim teaches that the aging of NdFeB magnets occurs at a temperature between 350 and the sintering temperature, wherein the sintering temperature is between 900-1200C (See Column 8). The intermittent heat treatment to dispose DyF_3 on the magnetic forms to improve their properties is from 500-1100C (See Column 2, Lines 0-10). Therefore within this combination of references, the sintering temperature can be greater than the heat treatment temperature, which in turn is greater than the aging temperature.

Regarding Claim 29: Nakamura teaches an acid cleaning step after heat treatment (See Page 13)

1. Claims 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura in 4859255 in view of Kim in 7,163,591 and further in view of Nakamura as applied to claim 11 above, and further in view of Mitsuji in 5286366.

2.

Please review the rejection under Fujimura in view of Kim and further in view of Nakamura to understand the scope of this invention.

The applied art does not teach using an acid, alkali, or organic solvent to clean the magnet form.

Mitsuji, however, teaches that it is beneficial to add several other layers to the surface of a Nd-Fe-B type magnet due to this composition's inherently poor chemical resistance. This is improved by adding nickel and copper coatings to prevent chemical degradation (See Abstract). In order to add this layer the magnet must first have its outer surface layer removed, since this layer has been degraded by the manufacturing process. The magnet is thus etched with nitric and acetic acid to remove from 5-20 microns (See Column 5, Lines 10-35). The layers are then applied to the magnetic material. One of ordinary skill would find that the process of etching the surface of the magnet prior to the powder disposing step would be beneficial as this process would remove any domains that had been reversed during the processing of the material.

The process of altering the surface of the article, necessitates that the article's composition can be acted upon and thus would require the removal of oxide layers which would inhibit the diffusion of the Dy or F to the magnetic core. Therefore, the process of cleaning a magnet prior to post processing would be obvious and motivated in the view of one of ordinary skill in the art. Another cleaning step prior to the final coating process would also be obvious since the disposal of the Dy-fluoride powder requires a heat treatment step, in which the

oxide skin would redevelop and would subsequently need to be removed by the same process prior to the plating operation.

3. Claims 27-28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura in 4859255 in view of Kim in 7,163,591 and further in view of Nakamura as applied to claim 11 above, and further in view of Hamada in 6777097.

Please review the rejection under Fujimura in view of Kim and further in view of Nakamura to understand the scope of this invention.

The applied art does not teach a shot peening step prior to disposing the powder on the sintered magnet.

Hamada, however, teaches that it is beneficial to add a composite coating to the surface of a Nd-Fe-B type magnet due to this composition's inherently poor chemical resistance. This is improved by adding a silicone resin along with flakes of fine powder to prevent chemical degradation (See Abstract). In order to add this layer the magnet must first have its outer surface layer removed, since oxidation must be removed from the surface of the magnet. The magnet can thus be put through several different processes to attain this goal, such as shot blasting or cleaning with caustic fluids (See Column 5, Lines 30-60). The layers are then applied to the magnetic material. The use of this process would clean

the surface of the magnetic form of oxides in order to allow the plating process to occur. Thus under this interpretation the particles of Kim are an initial magnetic form, where the formed particles represent a final magnetic form. The term magnetic form is never explicitly defined. After dip coating the composite magnet is heat treated to decompose the silicone resin into silica (See Column 5, Lines 5-15).

The process of altering the surface of the article, necessitates that the article's composition can be acted upon and thus would require the removal of oxide layers which would inhibit the diffusion of the Dy or F to the magnetic core. Therefore, the process of cleaning a magnet by shot peening prior to post processing would be obvious and motivated in the view of one of ordinary skill in the art.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 11 and 19-32 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over copending application 11/916498. Although the conflicting claims are not identical, they are not patentably distinct from each other because the copending application claims a process obviating the claimed process. The copending application includes a method of preparing said rare earth iron boride composition from a sintered magnet, wherein a powder of a fluoride, oxide, or oxyfluoride of a rare earth element is disposed on the surface of the magnet and then heat treated. Thereafter the magnet is heat treated to form the final product. Further

steps of washing and various dimensions and components in the rare earth elements are disclosed in the dependent claims of the patented application. These claims generally parallel those claims in the instant application. Although the copending application's process includes an additional component in the coating, the process of the conflicting claims still obviates those of the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

2. The indicated allowability of claim 11 and dependencies is withdrawn in view of the newly discovered reference(s) to 11/916498 and Nakamura.

Response to Arguments

3. Applicant's arguments with respect to claims 11 and 19-32 have been considered but are moot in view of the new ground(s) of rejection. After a close review of the instant assignee/inventor's copending applications, an additional double patenting rejection has been made. After the filing and approval of a Terminal Disclaimer against this copending application, allowance is expected. The secondary reference to Nakamura (appearing in the IDS of 11/30/2007) also seems more relevant than previously appreciated.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Hoban whose telephone number is (571) 270-3585. The examiner can normally be reached on Monday - Friday from 7:30 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew E Hoban/
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793